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ANNUAL REPORT 1972

DEPARTMENT OF WATER AND SEWERS



CITY OF CHICAGO - RICHARD J. DALEY, MAYOR



ANNUAL REPORT 1972

DEPARTMENT OF WATER AND SEWERS - CITY OF CHICAGO

CHICAGO CITY COUNCIL 1972

HON. RICHARD J. DALEY
Mayor

JOHN C. MARCIN
City Clerk

CLAUDE W. B. HOLMAN

MORTON A. GORDON
City Clerk

- Ward
- | | |
|---------------------------|-------|
| 1. Fred B. Roti | 11. M |
| 2. William Barnett (a) | 12. D |
| 3. Tyrone T. Kenner | 13. C |
| 4. Claude W. B. Holman | 14. E |
| 5. Leon M. Despres | 15. F |
| 6. Eugene Sawyer | 16. A |
| 7. Robert S. Wilinski (b) | 17. W |
| 8. William Cousins, Jr. | 18. E |
| 9. Alexander A. Adduci | 19. T |
| 10. Edward R. Vrdolyak | 20. C |

(a) Elected

Michael Coletta
Sergeant-at-Arms

Assistant

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City of Chicago, Department
ANNUAL REPORT,
DEPARTMENT OF WATER
AND SEWERS, CITY OF
CHICAGO.

DATE

ISSUED TO

The Honorable Richard J. Daley
The Honorable Member
City of Chicago, Illinois

Gentlemen:

The primary function of the Department of Water and Sewers is to provide the highest quality of service to the communities served by the Chicago Water System. The Department's 227 square miles of territory are placed in operation.

The Department of Water and Sewers is responsible for the operation and maintenance of the facilities of the Chicago Water System. The Department receives no funds from the City of Chicago.

At this time we wish to express our thanks to all City Council members who have served, and, as always,

- Ward
- | |
|--------------------------|
| 41. Edward T. Scholl |
| 42. Burton F. Natarus |
| 43. William S. Singer |
| 44. Dick Simpson |
| 45. Edwin P. Fifielski |
| 46. Christopher B. Cohen |
| 47. John J. Hoellen |
| 48. Marilou Hedlund |
| 49. Paul T. Wigoda |
| 50. Jack I. Sperling |

8, 1972

Secretary

C. R. Berek
Managing Editor
Council Journal

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City of Chicago, Department
ANNUAL REPORT,
DEPARTMENT OF WATER
AND SEWERS, CITY OF
CHICAGO.

provide water of the highest quality to the communities served by the Chicago Water System within the City of Chicago, which highlights the water system was

operation and maintenance of the facilities of the Chicago Water System on January 1, 1953. The sale of water and

dynamic leadership in the operation, we extend our thanks to the public who

DEMCO

Respectfully submitted,

James W. Sullivan
Commissioner

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HIGHLIGHTS

□ Total collections for the Water Fund in 1972 from metered-rate accounts, assessed-rate accounts, sewer rental accounts and from miscellaneous sources amounted to \$68,516,438. Programmed expenditures for capital improvements during the period 1973 to 1977 call for approximately \$150,000,000.

□ During 1972, an average of one billion, ten million gallons of water per day, totaling almost 370 billion gallons for the year, was pumped to consumers by the Water System's eleven pumping stations. The year's highest daily pumpage of 1,663 million gallons and its peak hourly pumpage rate (at 4:00 P.M.) of 2,252 million gallons a day were attained on August 18th.

□ More than 15 miles of new water mains were placed in service and 12.36 miles of sewers were constructed in 1972. The Sewerage System was also expanded by 730 additional catch basins and 402 manholes.

□ The three laboratories of the Water Purification Laboratory Section at the Central Water Filtration Plant and the two control laboratories—one of which is located at each of the two Filtration Plants—conducted 811,694 tests of water samples during the year.

□ In 1972, the Chicago City Council approved the 75 elevations for street grades and 162 standard bench monuments and ordinary benches which were established by the Bench and Grade Section engineers of the Bureau of Sewers. These bench monuments are used by land surveyors, engineers and architects when they perform the work of their professions within the City of Chicago.

□ During the year, the Mayfair Pumping Station became the third steam-operated station completely converted to use natural gas fuel (with oil as a standby) instead of coal.

□ More than 35,000 feet of large feeder mains were cleaned and lined with cement in 1972—a procedure which restores their original carrying capacities, no matter how long the mains have been in service.

□ Improvements completed in 1972 include the placing in service of the South Water Filtration Plant's new Control Room and its Status Board. Structures and equipment necessary for the removal of sediment from settling basins via the Metropolitan Sanitary District of Greater Chicago sewer system for disposal, rather than return to the Lake, were placed in operation at both Water

Filtration Plants. Also, an addition to the South Plant's chemical building was constructed to house new chlorine facilities.

□ During 1972, the Repair and Construction Division of the Bureau of Sewers completed 9,387 sewer system repairs. The Bureau's maintenance activities also included scraping 10,087,412 feet of sewers and cleaning 292,245 catch basins.

□ The Department's 1972 safety record again provided for an impressively favorable comparison with the national average rate for water utilities, as compiled by the National Safety Council.

□ In 1972, the Water Distribution Division acquired twelve new air compressors with noise suppression features. Their use resulted in the abatement of noise pollution.

□ Also during the year, twelve hydraulic (truck-mounted) valve operators were purchased by the Distribution Division to aid crews in repairing broken mains.

□ By the year's end, 16,619 persons had toured the Central Water Filtration Plant. Visitors included dignitaries from foreign countries, engineers and scientists, but most were students of all grade levels from Chicago Area schools. In June, more than 700 participants of the 1972 American Water Works Conference, which was held in Chicago, observed the world's largest water treatment plant in operation.



Mayor Richard J. Daley greets AWWA Executive Director Eric F. Johnson on opening day of Association's convention.

TWELVE DECADES OF DYNAMIC PROGRESS

The year 1972 is doubly significant in the history of Chicago. One hundred and twenty years ago, during 1852, construction began on a City-owned Water System.

The system consisted of 600 feet of 30-inch wooden intake pipe, an 8 million gallon per day steam driven walking beam type pump (dubbed "Old Sally"), an elevated standpipe, 30 miles of cast iron pipe and three 500,000 gallon storage tanks located in the North, South and West sections of the City. "Old Sally" was installed under the supervision of Chief Engineer, DeWitt C. Cregier, who later was appointed Commissioner of Public Works and elected Mayor in 1889.

The first cast iron water mains, 4-inches in diameter, were laid in Clark Street during 1852. The system was placed in service in February, 1854, pumping 591,000 gallons per day for 65,000 persons.

During this mid-19th century period of Chicago's history, the City's sewage was channeled either directly into Lake Michigan or through the Chicago River into the Lake. The City's population grew at such an astounding rate that this method of disposal caused the source of water supply to become dangerously contaminated. To circumvent this unwholesome situation, in 1867 a water intake crib was constructed two miles east of the Lake's shoreline and a 5-foot diameter brick tunnel then connected it to the new Chicago Avenue Pumping Station, which is still in full operation after more than a century of reliable service.

During the years of the Civil War, from 1861 to 1865, the number of Chicago's residents rose from 120,000 to 178,000. At the end of that period, the City's Water System had a rated pumping capacity of 20 million gallons a day.

Today, in its 120th year of operation, the System furnishes 4,536,000 persons residing in Chicago and 72 suburban communities with treated water. It presently consists of four active or standby water intake cribs, the world's two largest water treatment plants, nearly 73 miles

of water supply tunnels, and 4,150 miles of water mains; it has the phenomenal rated daily pumping capacity of almost three billion gallons.

In 1834 the trustees of the Town of Chicago authorized a \$60 loan to pay for having trenches dug along State Street to channel storm water runoff into the Chicago River. (This was the first financial obligation to be incurred by the Town.) On March 4, 1837, Chicago was granted a City Charter.

In 1855 the City's Board of Sewerage Commissioners recommended that a system of intercepting sewers be constructed that would discharge into Lake Michigan; the first six miles of such sewers were completed during 1856. By 1886 the area of Chicago had grown to 36 square miles and its population had increased to over 720,000.

During this period, while many industries were being established along the Chicago River, the number of the City's inhabitants was increasing so rapidly as to induce a seemingly unsurmountable sewage disposal problem. The sewers were adequate but the domestic sewage together with the tannery wastes and the refuse of slaughter houses and distilleries that were discharged into the north and south branches of the Chicago River turned it into a veritable open sewer.

Fortunately, however, at the dawning of the twentieth century the Sanitary and Ship Canal that had been under construction since 1892 began to operate and the direction of the Chicago River's flow was reversed to prevent river borne wastes from emptying into the Lake. This remarkable accomplishment, which by itself incited worldwide acclaim, was in 1922 followed by a similar diversion of the Calumet River's flow through the construction of the Calumet-Sag Canal, thus also preventing polluted river water from reaching Lake Michigan. A system of locks and control structures was built to regulate the flow of Chicago's rivers and channels.

During 1967 work began on what has been likened in importance to the reversal of the Chicago River's flow—the Lawrence Avenue element of the Chicago Underflow Sewer System, which

was designed by the Chicago Department of Public Works. Two additional elements were placed under contract by the Metropolitan Sanitary District of Greater Chicago, one along 47th Street in LaGrange and the other under Pulaski Road north of the Calumet Sag Canal.

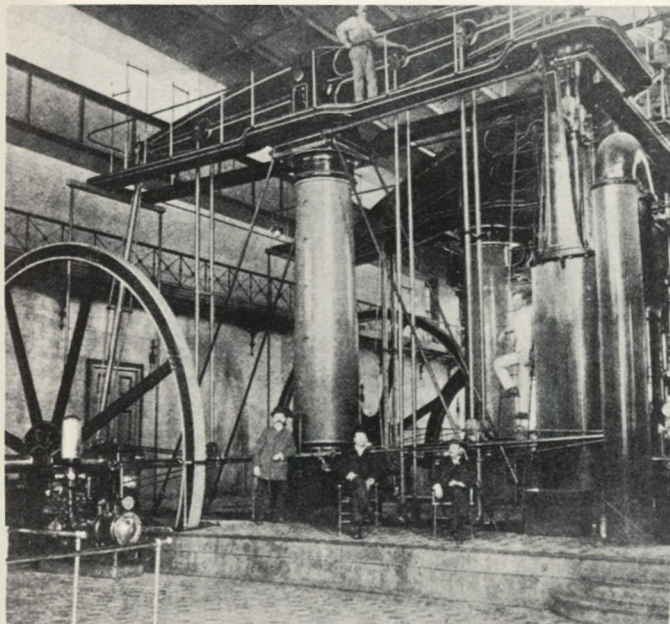
These underflow systems will store the combined flow during small and medium rainfalls and thereby substantially reduce the frequency of overflow to the waterways. After a storm, the stored polluted water will be pumped to intercepting sewers and then to treatment facilities. During heavy rainfalls, the systems will provide large storage capacity and so eliminate or reduce basement and underpass flooding.

The end of 1972 also closes the Department of Water and Sewers' 20th year of functioning as a separate City department. The Bureau of Water now operates as a public utility that pumps more water through metered services to domestic and industrial consumers than any other water system in America. More than half of all the money invested in the improvement of the Chicago Water

System was expended during the last 15 years.

However, Chicago's water is still one of the lowest priced of all commodities important to everyday life. Its cost to consumers, which compares favorably with the amounts charged in other large cities of America, is among the very lowest. The Department is determined that the Water Fund's record of economy be maintained in the years to come.

The responsibility of providing an adequate supply of potable water is accompanied with the problem of what will be done with it as sewage after it has been used—how it will be treated and returned to streams as clear water and how to dispose of the sludge resulting from the treatment. In addition to Chicago, many other communities involved are located in the area served by the Chicago Water System. Treatment of sewage and sludge disposal are the concern of the Metropolitan Sanitary District of Greater Chicago, but collecting the sewage from its source and conveying it to the District's intercepting sewers is the responsibility of those communities.



Chicago Water System's first pump, called "Old Sally," was built in 1852—120 years ago. It was the system's only pump and had a rated capacity of 8 million gallons per day.



Chicago's Central Water Filtration Plant—the world's largest. This plant and the South Water Filtration Plant have a combined rated capacity of 2 billion, 600 million gallons per day.

PURIFICATION

During 1972, the Central and South Water Filtration Plants treated 385 billion gallons of water supplied by Lake Michigan. The Central Plant's peak pumpage hour occurred on August 18, at 7 P.M. at the rate of 1,454 million gallons per day. The South Plant's maximum rate of 764 million gallons per day was attained at 8 P.M. on August 18.

In conjunction with the responsibility for the operation of the Central and South Water Filtration Plants, the Water Purification Division is relied upon also to insure that the water distributed through the Chicago Water System be pure and of a consistently high quality.

During 1972, the Division continued many diverse activities directed toward safeguarding the water against contamination. For example, immediately after water mains, tunnels and shafts were repaired or installed they were flushed and disinfected with chlorine. Samples of water from such facilities were then collected by the Water Quality Surveillance Section to guarantee that the water is of a safe sanitary quality.

Water samples were regularly taken at the System's eleven pumping stations, at strategic points in the distribution system and along rivers and lakefront harbors to be tested at the Division's Microbiology and Chemical Laboratories. Water quality surveys of Lake Michigan were conducted—with special attention devoted to those areas near the water intake cribs and Filtration Plant intakes.

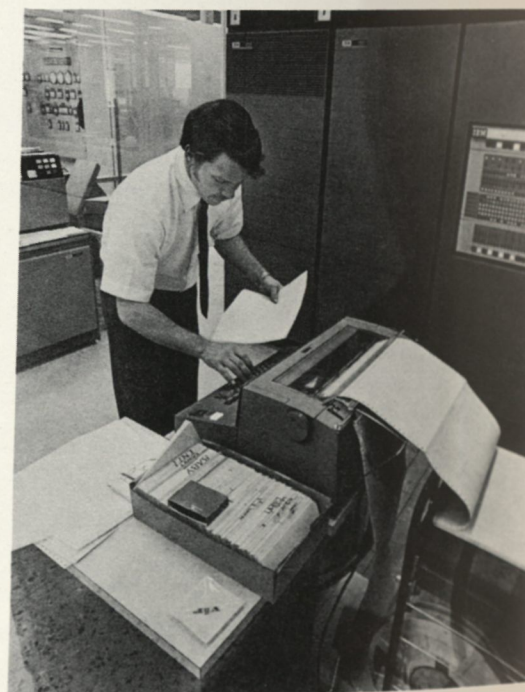
In accordance with current plans, it is anticipated that the historical and contemporary data gleaned from these Lake surveys will acquire an even greater value when combined with the Federal Government's compendium of environmental information. The water sampling program is presently undergoing revision; the Department's intent is that its flexibility and its coverage be expanded.

The Water Purification Laboratory Section's three laboratory units at the Central Water Filtration Plant were routinely provided water samples by the Water Quality Surveillance Section and other sources. This section plus the two control laboratories (one at each of the two Filtration Plants) performed over 2,000 tests daily.

The precise number of tests made at each of the purity control laboratories and the amounts of the various chemicals applied in the water treatment process during the year are listed in the Major Statistics pages of this Report.

Chemical application methods of the Central and South Filtration Plants are similar. Chlorine is added to disinfect the water of virulent organisms; fluorine to help children develop strong and healthy teeth; carbon to eliminate displeasing tastes and odors. Also, there are additives to reduce corrosion of water pipe; and other chemicals are added to aid coagulation in the precipitation and settlement of impurities.

Major Capital Improvement projects toward which the endeavors of the Water Purification Division were directed during 1972 included the design of systems at both Filtration Plants for the disposal of sediment from the settling basins and the return of the filter backwash water to the intake basins. With the approval of the Metropolitan Sanitary District of Greater Chicago, facilities were constructed at both Plants to provide for the



The Central Water Filtration Plant's data analysis room, where plant operation is monitored, complex computations are made and critical data is stored.

discharge of sediment from the settling basins into a sewer line connected to an interceptor of the Sanitary District. Sediment is not returned into Lake Michigan.

The South Water Filtration Plant was placed in complete operation 25 years ago with a peak capacity of 600 million gallons a day. By 1967 heavier demands had necessitated the expansion of this plant's facilities, so its maximum capacity was increased to 850 million gallons a day. With its recently completed Control Room, the South Plant is presently engaged in a modernization program concerned with chemical feed equipment and instrumentation, including sampling systems, automatic analyzers, flow measurement devices and emergency power sources.

At the Central Water Filtration Plant, two new electrical unit substations and associated motor control centers were installed for both the sediment disposal system and for a new high-energy mixer installation. The latter involves eight 60-horsepower mixers that, when installed in the raw water channels, will improve the efficiency of

the coagulant chemical. Also, the installation of flow measuring elements and sluice gates for the Plant's west clearwell outlets will result in improved hydraulic capabilities.

During 1972, the Central Water Filtration Plant, which has evolved into the showplace of the Department of Water and Sewers, served as host to a total of 16,619 visitors, including foreign officials, professionals, technicians and student engineers from many different countries. Plant tours were composed mainly of students of all levels, including grammar school pupils. During the June, 1972 conference of the American Water Works Association, over 700 waterworks engineers participated in Plant tours.

Since its formal dedication in 1970, the John R. Baylis Memorial Library and Technical Information Center has continued to broaden its services and its coverage. It is anticipated that as employees of this Department become more aware of the wealth of a relevant technical literature available, the Library will eventually be regarded as one of the most valuable fringe benefits granted by the City of Chicago.



One of the Water Purification Laboratory Section's laboratory units —over 2,000 tests are performed each day on water samples provided by the Water Quality Surveillance Section and other sources.



Engineer is operating one of the Central Water Filtration Plant's consoles which control the filtering and backwashing processes. During the year, 385 billion gallons passed through the Central and South Plants' filters.

PUMPING

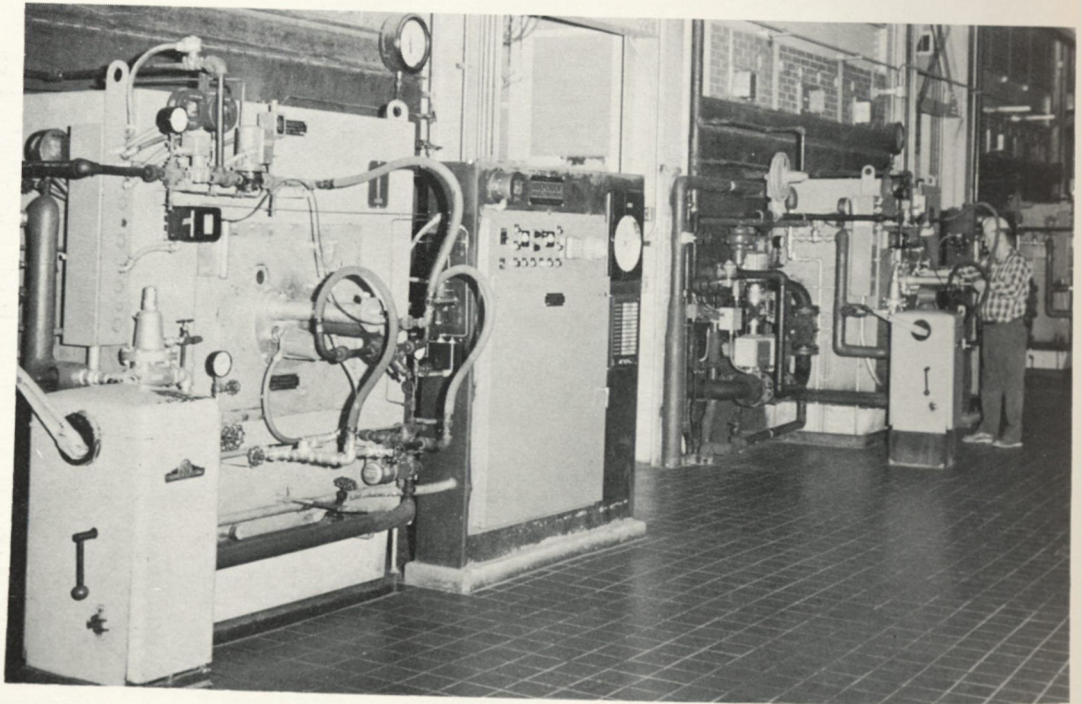
Responsibilities of the Pumping Station Operation Division include the operation and maintenance of: four water intake cribs located in Lake Michigan, two to two and one-half miles off shore; more than 72 miles of water tunnels under the Lake and under City streets; eleven pumping stations, six of which are powered by electricity and five by steam; the 30-million gallon Western Avenue Pumping Station reservoir which is connected to the discharge header of the station (it provides the South Water Filtration Plant with a more uniform rate of operation during hours of peak demand); and the Hegewisch Sewage Pumping Station functioning in the far south-east area of Chicago.

During 1972, a total of 369,884 million gallons of water was pumped by the Chicago Water System's pumping stations from tunnels connected to the reservoirs of the filtration plants.

The north district of the 440 square-mile area that relies upon the Chicago Water System is served by three pumping stations; four stations serve the central district; and four serve the south district. These are the stations that pump the water from the supply tunnels to the distribution mains leading finally to homes, apartment buildings, stores, factories and fire hydrants.

The day of the year on which the largest quantity of water was pumped by the stations was August 18 when 1,663 million gallons of the sparklingly clear product of filtration plant treatment was delivered to the distribution system.

The highest hourly pumpage rate was also attained on August 18. At 4:00 P.M. on that day the System's stations were pumping water at the rate of 2,252 million gallons a day.



The City of Chicago's determined battle with air pollution is illustrated above by the natural gas conversion units that were installed at the Mayfair Pumping Station; it no longer uses coal as fuel.

On 42 days during the year, the Hegewisch Sewage Pumping Station was placed in service. On those days the capacity of the sewerage system serving that area had been exceeded and the Station was compelled to pump a total of 84,553,295 gallons of storm water.

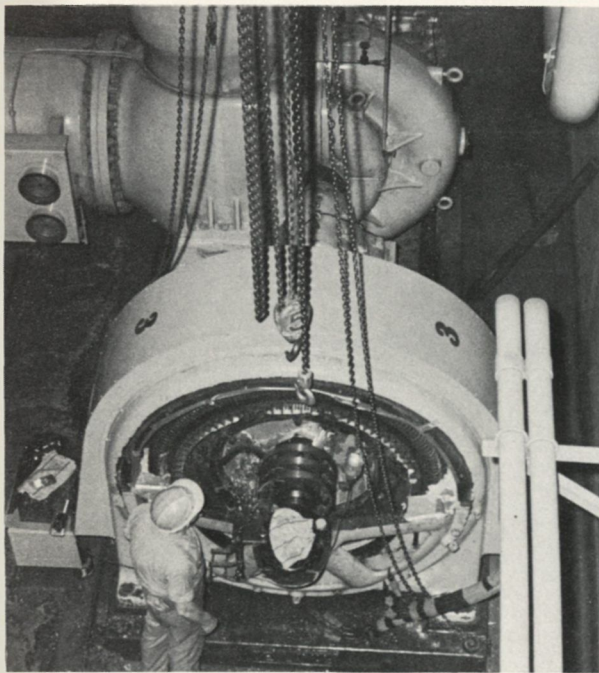
The fuel conversion program, which was originated for the purpose of reducing the possibility of particulate matter and sulfur dioxide being emitted into the air from smokestacks of the five steam-driven pumping stations, continued to progress during the year.

When the Mayfair Pumping Station discontinued its use of coal as fuel in March of 1972, it was the third station to have done so.

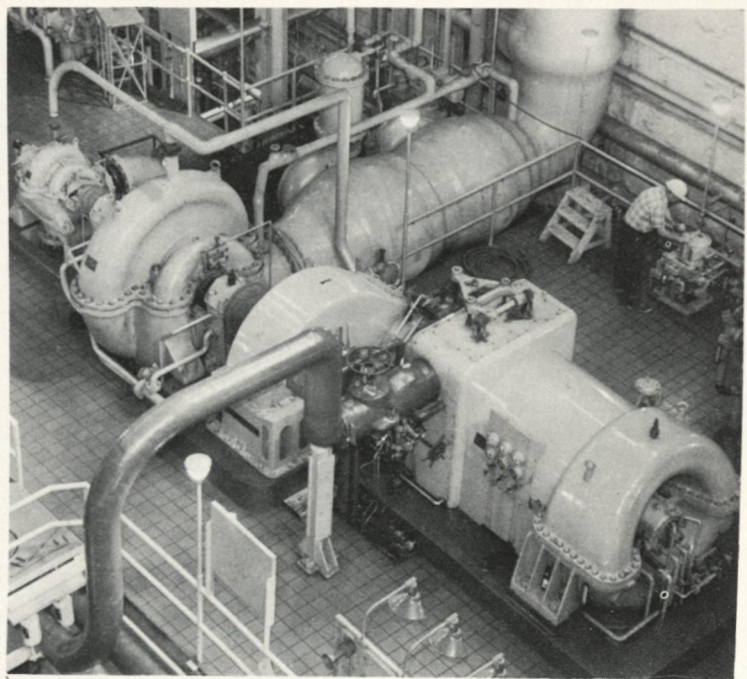
During the year which is covered by this Report, earlier plans for the modernization and

expansion of the Thomas Jefferson Pumping Station began to materialize. It was determined what type of pumping equipment will replace the present four electrically operated pumps when they are retired after 45 years of reliable service.

Throughout 1972, the Pumping Station Efficiency Section tested equipment and participated in the Division's endeavor to resolve the numerous and varied problems it confronts while operating Chicago's complex water pumping system. The Section periodically tested the steam turbine and electric motor driven pumps and other pumping station and filtration plant equipment to ascertain its efficiency and to compile data upon which the preventive maintenance programs are based. Boilers at the steam-driven pumping stations were also checked monthly and hydraulic surveys of the water tunnel system were conducted during the reporting period.



One of the Chicago Avenue Pumping Station's six electric powered pumps undergoing maintenance procedures.



Engineer is servicing an oil separator of a Springfield Avenue Pumping unit having a daily pumping capacity of 60 million gallons.

DISTRIBUTION

The Water Distribution Division renders a 24-hour home delivery service to the 3½ million residents of Chicago. It also maintains the vast network of underground pipe that links users' water taps to the pumping stations.

Service pipes leading into homes and other buildings connect with branching lines which are supplied by larger mains with the water they in turn received from feeder mains. Suburban mains are connected at the City limits to the Chicago Water System to convey the water to the 72 communities that rely upon this City's water system. The water pipe installation projects of 1972 raised the total number of mains in service (varying in diameter from six to sixty inches) to 4,150 miles. This does not include the mains in those suburban areas served by the Chicago Water System.

It is also the Distribution Division's responsibility to ensure that Chicago's more than 46,000 fire hydrants are always readily available to supply the water so vitally needed by the City's Fire Department to fight fires. During 1972, 180 new hydrants were installed.

The Water Distribution System is presently equipped with over 43,000 line valves; 230 were

added in the year covered by this Report. The purpose of these valves is to help maintain water pressures suitable for prevailing conditions and to control the direction and force of water's flow through mains. Their use minimizes inconveniences caused by water shutoffs while mains are being repaired.

It was through the main construction and maintenance activities of the Distribution Division in 1972 that a 2½-mile long, 36-inch diameter, water main was installed in Marine Drive and Sheridan Road, from Montrose Avenue to Fullerton Parkway. About 1/3 of the mains constructed during the year were feeder mains, 24 inches and larger in diameter.

During that period, over six miles of various-sized cast iron feeder mains were cleaned and cement lined. This procedure restores the interior of a main equal to or better than its original flow capacities—no matter how many years it has been in service. Its capacity can be increased by more than 65% and in this way the process provides for a substantial saving in the expense and labor involved in the construction of new mains. A 36-inch main is cleaned and lined at about 1/10 of the cost of laying a new main. Further, the necessity of street trenching that would cause



Left—A 60-inch concrete bend is installed during construction of a 60-inch main under Lawrence Avenue. Right—Prevailing conditions made it necessary for the main under construction to pass underneath an eight-foot sewer.

traffic disruption and other public annoyances is eliminated.

The Division's employment of sophisticated techniques for locating hidden leaks in Chicago's immense underground Water Distribution System includes a program of electro-sonic monitoring of mains. In 1972, specially trained personnel of the Field Engineering Service Unit surveyed more than 2,700 miles of mains for leaks.

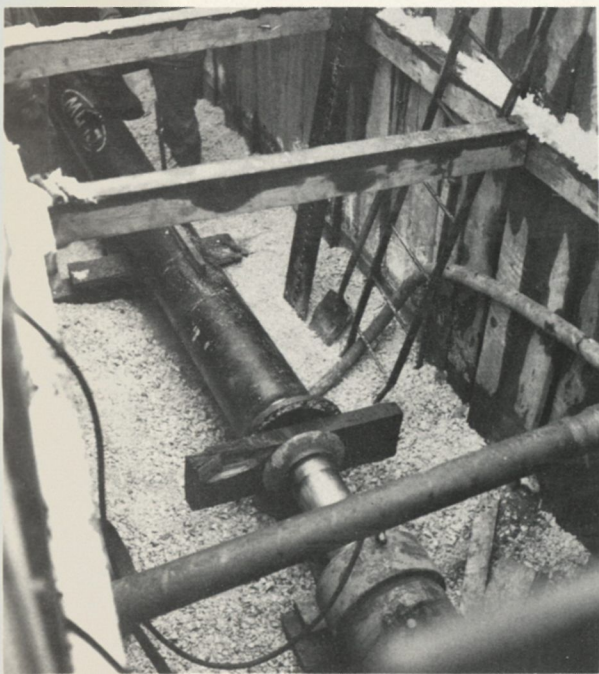
Repair crews, which are provided with radio-equipped maintenance trucks, can be speedily dispatched at any time of the day or night when the need of repairs is urgent.

The Plumbing Inspection Section conducted inspections and surveys of industrial, commercial and residential buildings to eliminate potential hazards to the potability of the water supply caused by faulty plumbing systems. The prevention of unauthorized changes or additions to the water supply system demands constant vigilance. Service pipe installations, air conditioning and refrigerating units, clothes washers, dishwashers and other water using appliances are periodically inspected to ensure compliance with the Municipal Code of Chicago and other pertinent laws and regulations concerning plumbing installations.

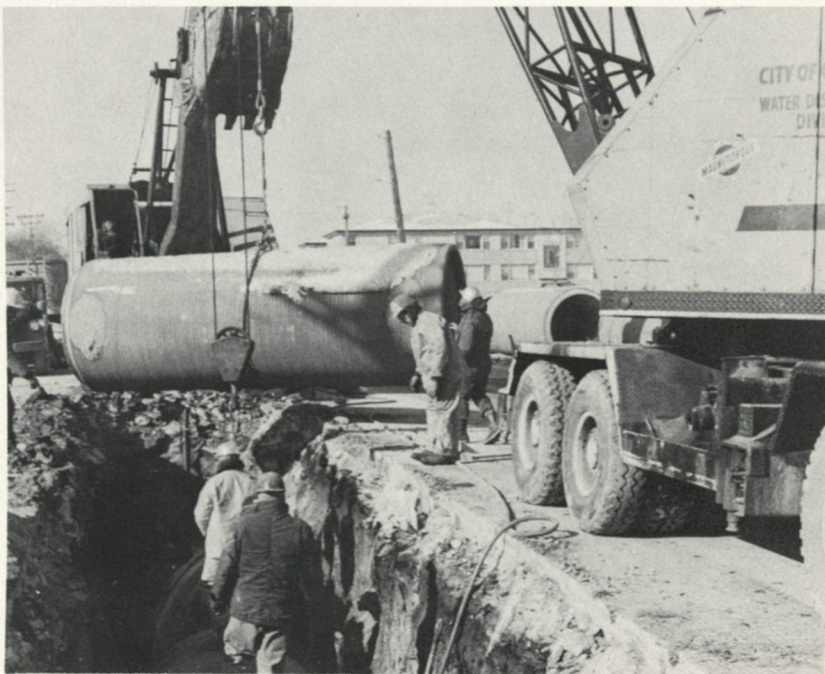
Areas where buildings were razed while slum clearance or large housing projects were in progress were inspected to make certain that all unused pipes were properly cut and sealed.

The Distribution Division also maintains a Plumbing Testing Laboratory where new devices, fixtures and equipment manufactured for the purpose of being used in connection with Chicago's water supply system are checked for infractions of City ordinances. During 1972, a total of 48 types of such water appurtenances were tested to ensure that, when used, they will not be detrimental to safe, efficient distribution of water.

A Communication Center, which is located in Room 402, City Hall, plays a vital role in Chicago Water System operations. It functions as a communication, monitoring and dispatching center for the entire Department and is manned 24 hours every day of the year. The Center is equipped with Police and Fire Department telephones for direct communication. With such arrangements, the Department and Division are able to respond immediately to emergencies. All fires of 2-11 intensity or greater are reported to, and attended by, Division field forces. When hydrants and water mains are withdrawn from service, the Fire Department is notified.



Water main is being jacked into place—a procedure frequently followed while constructing mains under railroad tracks.



A section of 60-inch water main being lowered into position along Lawrence Avenue. This main will connect the Mayfair Pumping Station to O'Hare Airport.

METERING

When measured by the tonnage of the product it processes, the City of Chicago's Water Works is by far the largest industry in the Midwest; it sells more water through meters each day than does any other City in the world.

Presently almost 80% of revenues received from the sale of Chicago water for domestic, commercial and industrial consumption is derived from metered accounts. The Municipal Code provides that one-family residences and two-flat buildings that require no more water than can be supplied through a $\frac{5}{8}$ -inch water meter are exempt from the metering method. Instead, water is sold to holders of such property on an assessed-rate basis which is determined by the size of the buildings and the lots upon which they are located as well as the number of plumbing fixtures on the premises.

Most salient among the Water Meter Division's responsibilities and functions are the in-

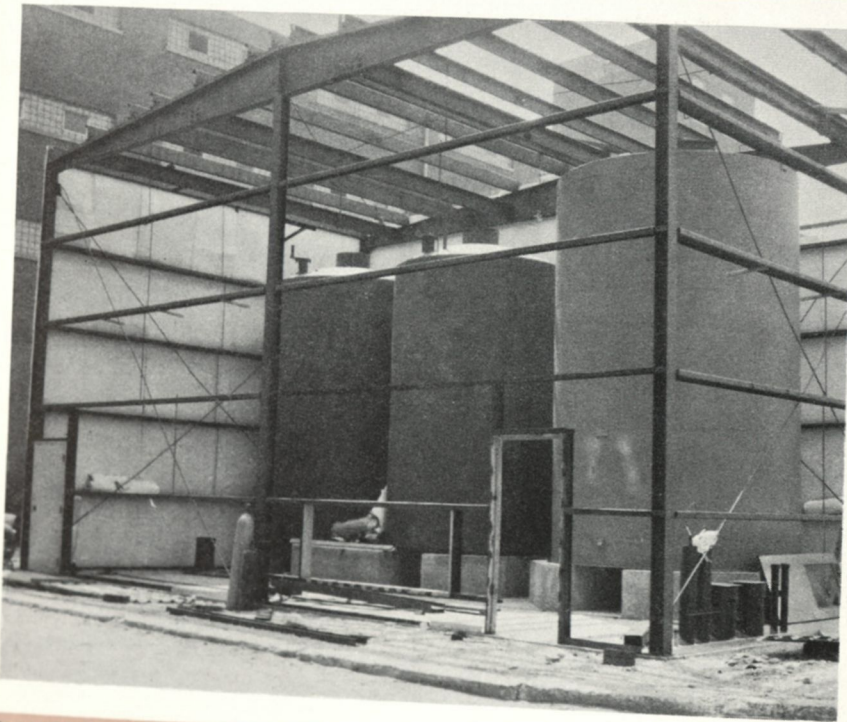
stallation and maintenance of water meters. Meters are repaired in both the field and the Division shop. Those in the need of shop repair are withdrawn from service, disassembled, cleaned, restored to working condition, tested and added to stock for future use.

During the year, 1,101 meters were installed and by the end of 1972 the total number in service was 164,049. Within that same period, 15,261 meters were overhauled in the shop; 13,366 were repaired on the premises; and 16,203 were tested for various reasons. The Division also maintains the turbine-type meters that measure the flow of water to the 72 suburban communities served by the Chicago Water System.

Construction of a new large-meter testing facility adjacent to the meter repair shop commenced during 1972. When completed in 1973, it will enable the Division to test all 3-inch to 12-inch size meters in accordance with the American Water Works Association's stringent testing procedure standards.

When the new facility goes into full operation, it will consist of two storage tanks and three precisely designed and calibrated metering tanks. Flow rates as low as $\frac{1}{4}$ gallons per minute and as high as 2,800 gallons per minute will be measured accurately. Meters will be tested by comparing the quantity of water that has flowed into the metering tank with the reading on the meters under examination.

The major components of the meter testing unit are housed in a prefabricated steel building which was salvaged from the Central Water Filtration Plant—where it originally contained the emergency boiler that furnished heat to melt anchor ice from the Plant's shore water intake sluice gates and valves. Meters undergoing tests will be placed on a test bench in the meter shop and all operations in the prefab building will be controlled from an operating console located in the meter shop.



Large meter testing unit under construction. A substantial portion of this equipment, including the building in which it is housed, is composed of salvaged material.

ASSESSING. BILLING AND COLLECTING

In the 20 years during which the Department of Water and Sewers has been functioning as a separate Department, the number of accounts on the books of the Water Collection Division has grown by more than 57,000 and now, at the close of 1972, totals 511,056.

Since the start of 1953, many changes and improvements have been made in the operations of assessing, billing and collecting of water consumer accounts. In accordance with the Department's persistent policy calling for the use of the most modern methods and equipment available in all phases of its operation, a pilot program for a new billing and cash application process of the metered and assessed systems was started during September of 1972.

The full implementation of the new system in December resulted in the speedup of the billing and collecting procedures and an increase in the annual interest earned by the water fund of the Department of Water and Sewers because such funds are available sooner for deposit with the City Treasurer. Also, now all metered accounts are on the teleprocessing terminals, thus enabling clerks to render better service to the public on individual account information.

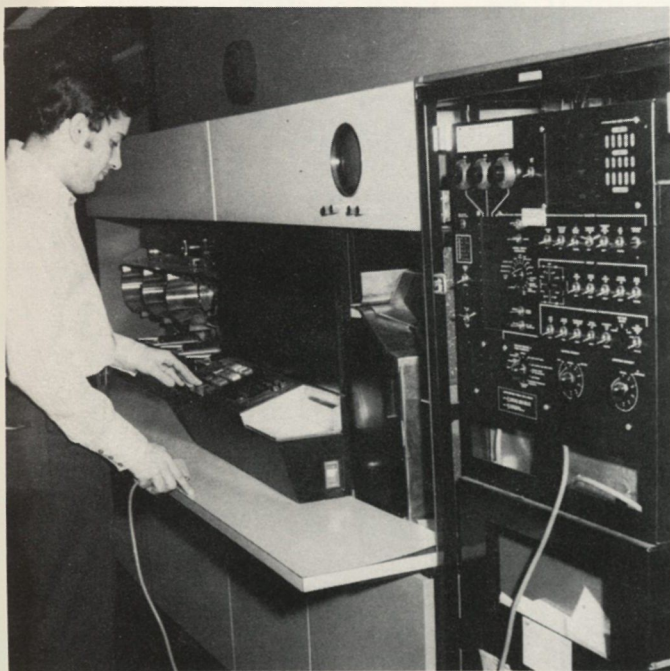
Because no changes in the general makeup,

layout or style of the new bills are anticipated in 1973, the Department purchased a full year's supply of blank forms and produced a saving of 40 percent in cost monetarily as well as in considerable delivery time.

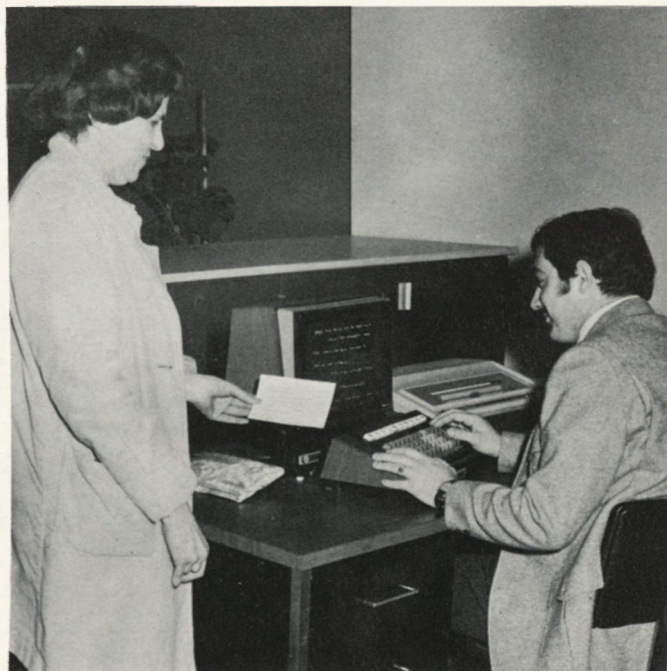
With the streamlined new mail handling procedures and the accelerated method of verifying vouchers by unit record section, the time required for the processing of revenues received by mail has been reduced from three days to two days.

The gross cash collections made by the Water Collection Division for the water fund during 1972 amounted to \$68,516,438. Of this total, \$54,241,606 was attributable to the 160,551 metered-rate accounts that were being serviced at the time the year ended; \$14,212,917 was acquired from 347,007 assessed-rate accounts; and \$61,915 came from miscellaneous sources.

In 1972, the Division's water rate takers performed 1,189,568 meter readings. Field men also made 43,630 visits to properties for the purpose of making assessments and reassessments, to resolve problems regarding water bills, and to investigate possible leakage and illicit usage of water. An additional collection of \$896,652 resulted from 43,871 visits to customers who are delinquent in payment of their water bills.



Employee scanning water payment cash stubs. Information acquired is applied to consumer's account.



Collection Division uses computer system's visual display unit to get immediate account information for quick service to customers.

CITY OF CHICAGO

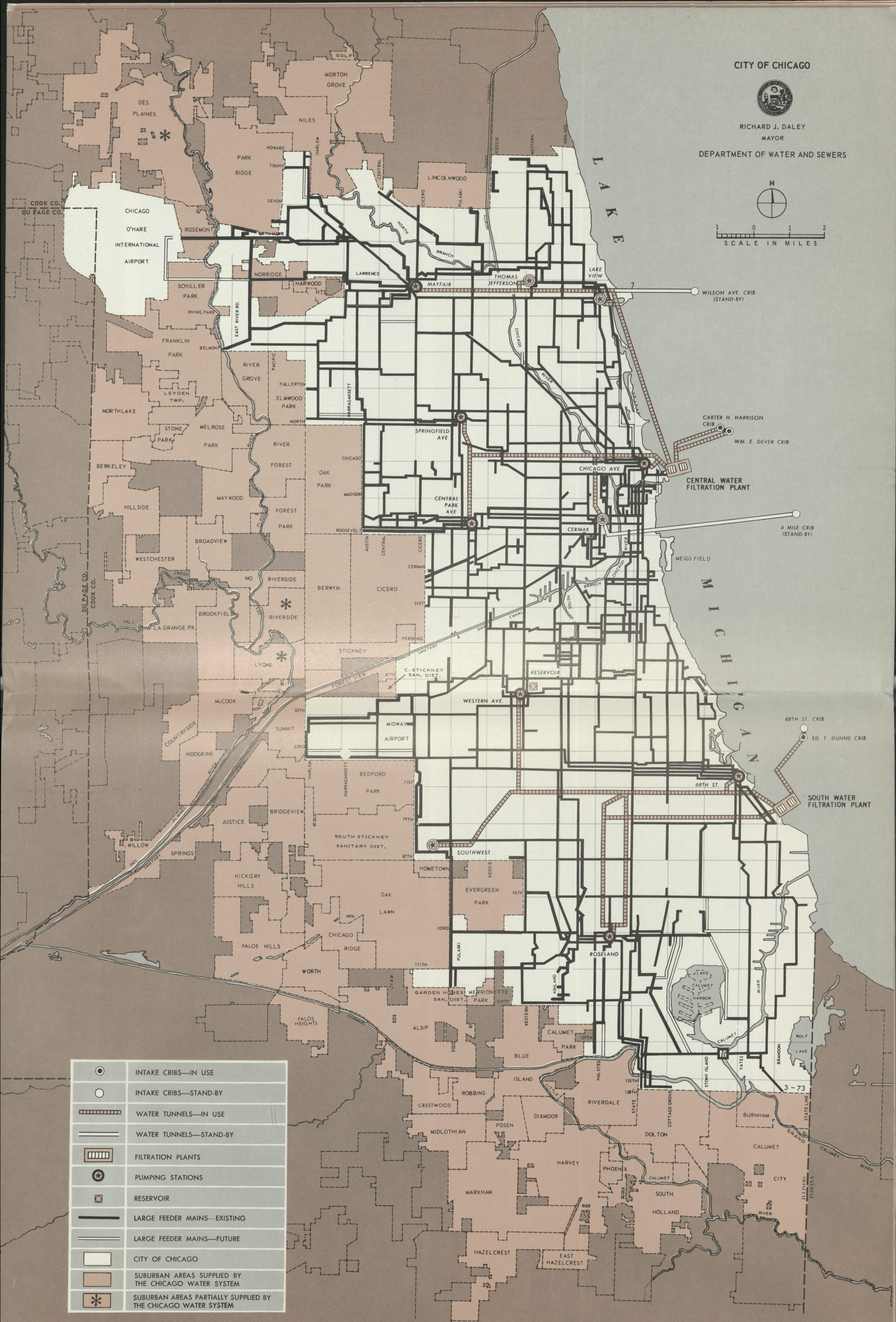


RICHARD J. DALEY
MAYOR

DEPARTMENT OF WATER AND SEWERS



1 0 1 2
SCALE IN MILES



	INTAKE CRIBS—IN USE
	INTAKE CRIBS—STAND-BY
	WATER TUNNELS—IN USE
	WATER TUNNELS—STAND-BY
	FILTRATION PLANTS
	PUMPING STATIONS
	RESERVOIR
	LARGE FEEDER MAINS—EXISTING
	LARGE FEEDER MAINS—FUTURE
	CITY OF CHICAGO
	SUBURBAN AREAS SUPPLIED BY THE CHICAGO WATER SYSTEM
	SUBURBAN AREAS PARTIALLY SUPPLIED BY THE CHICAGO WATER SYSTEM

SEWERS

A primitive settlement encircled Fort Dearborn soon after it was established near the mouth of the Chicago River. This small community was situated on a low and nearly level prairie, just a few feet higher than Lake Michigan. The number of settlers populating this area steadily increased, so that by 1833 (the year during which the muddy young region attained formal recognition as a Town) it had become apparent that if its citizenry hoped to live on dry ground rather than on marshland, the construction of an adequate drainage system would soon be imperative.

In 1834 the valiant, booming new urban center's initial response to this predicament was to borrow the \$60 that would pay for the provision of what would grow to over 4,100 miles of sewer with a replacement cost amounting to hundreds of millions of dollars. That first step taken

138 years ago consisted of digging trenches to channel storm water runoff from State Street into the River. By 1837 the flourishing young municipality had completely shed its humble origin as the "Fort Dearborn Settlement" when it was incorporated into the City of Chicago.

Despite its lowly inception, the Chicago Sewerage System developed into a vast drainage network that, at the close of 1972, included 148,411 manholes and 214,225 catch basins along with thousands of miles of sewers.

Industrial and domestic wastes are now discharged through private drains which are connected to the City-maintained sewers beneath the streets. When new sewers—public as well as private—are connected to the Chicago system, inspectors are assigned by the Bureau of Sewers to



Sewer junction chamber under construction.



Bureau of Sewers workers construct new vitrified tile sewer pipe.

insure that a proper, workmanlike connection is obtained and that the City sewer is protected against damage. In 1972 inspectors supervised the construction of 12.36 miles of sewers, 730 catch basins and 402 manholes.

Along with the construction of new facilities, the activities of the Bureau are directed also to the maintenance and repair of those already in existence. During the year, cleaning and repair crews scraped 10,087,412 feet of sewers, cleaned 292,245 catch basins and performed a total of 9,387 Sewer System repair jobs.

After comprehensive experimentation and a series of tests conducted under typical, normal city sewer system conditions with machines that were loaned to the Department for demonstration purposes, the Bureau of Sewers in 1972 pur-

chased a combination jet-rodding and vacuum cleaning vehicle. This new unit proved to be capable of removing various waste materials, such as rags, grease, plastic diaper liners and other debris that are difficult to dislodge by conventional cleaning methods. In this way, sewers are often opened and operating before the older-type scraping equipment is even able to arrive and be set up at the job site. As a completely self-contained unit, this new machine can be moved easily from one location to another—an additional improvement over the older equipment which requires that a truck be sent to tow a pair of scraping machines to the next job site.

In 1972, the Bench and Grade Section Engineers of the Bureau of Sewers established elevations for 162 bench monuments and 75 street grades. Bench monuments are points of known



Combined jet-rod and vacuum sewer cleaning machine is used to remove sewer blockage.



Concrete-breaking equipment opens pavements to facilitate rapid sewer repairs in the vast system which now includes more than 4140 miles of pipes.

elevation provided for the use of engineers, architects and surveyors in determining correct elevations when constructing buildings, sewers, bridges and other structures. Eighteen new bench monuments were constructed by the Bureau in 1972. These are concrete cylinders 16 inches in diameter and 8 feet long, with a stainless steel pin in their tops, which are buried in the ground. The elevation of the steel pin is determined by precise levels run by Bench and Grade Engineers.

Construction of the Lawrence Avenue Underflow Sewer System, under the supervision of the Department of Public Works, progressed during 1972. This relief sewer is located in bedrock about 250 feet below ground surface and it runs westward under Lawrence Avenue, from the North Branch of the Chicago River near California Avenue to Melvina Street, which is 6200 west.

After the Lawrence Avenue Underflow System is placed in operation, drainage will continue to be collected in the same manner as previously during normal periods. However, when the system is confronted with extremely heavy flow resulting from storm runoff, most of the excess drainage will be diverted into the new deep level sewer rather than overflow into waterways. These large quantities of storm water and sanitary drainage will be stored until the waste treatment plants of the Metropolitan Sanitary District of Greater Chicago are again operating within their normal load capacities.

Two other underflow systems are also being constructed, but by the Sanitary District. One is located in LaGrange along 47th Street and the other, in Chicago, runs under Crawford Avenue from the Calumet Sag Channel to 105th Street.



Machine automatically loads sewer scrapings into truck for disposal. During 1972 more than 10 million feet of sewers were scraped.



Commissioner Jardine presents In-Service Training Certificate to Engineer Barbara Fox, a successful participant of the Supervisory Training Program.

IN-SERVICE TRAINING

The staff of the Department of Water and Sewers constantly strives to improve and modernize its methods and facilities; it regards an efficient work force as foremost in importance to accomplish this objective. As an equal-opportunity employer, this Department stresses in-service training.

During 1972, the agenda followed to augment employees' skills included a Supervisory Training Program in which 52 employees of middle and upper levels participated. This program, geared to the operation of the Department, was designed to upgrade their efficiency in matters pertinent to supervisory activities.

A job-rotation training procedure, initiated during the preceding year, was continued in 1972 as an aid to newly employed engineers in becoming acquainted with the Department of Water and Sewers' various units.

Several qualified high school and college students were hired on a part-time basis under a program which combines training with experience. Also, the Department employed five high school students during the Summer in conformance with Mayor Daley's citywide Students-As-Trainees Program; four college students under the Civil Service Commission's Urban Intern Program; and 14 persons whose salaries were financed under the Federal Emergency Employment Act.

Departmental workers enrolled also in other classes of work-related subjects offered to participants of the Public Service Institute and Skill Improvement Program arranged through the Civil Service Commission. Moreover, employees of this Department benefited from the City of Chicago Tuition Reimbursement Program, under which part or all of the college tuition costs they incur is refunded upon successful completion of courses that enhance their careers with the City.

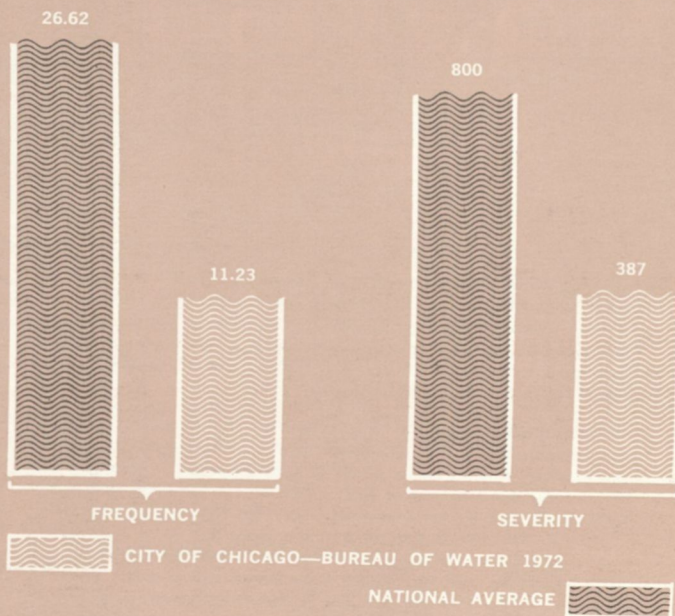
SAFETY

Irrecoverable time lost due to work accidents increases operating costs; work accidents cause needless human suffering; work accidents can be prevented. It was because of these facts that Chicago was one of the first large American cities to adopt a formal safety program as a protective measure benefiting not only employees but also the general public.

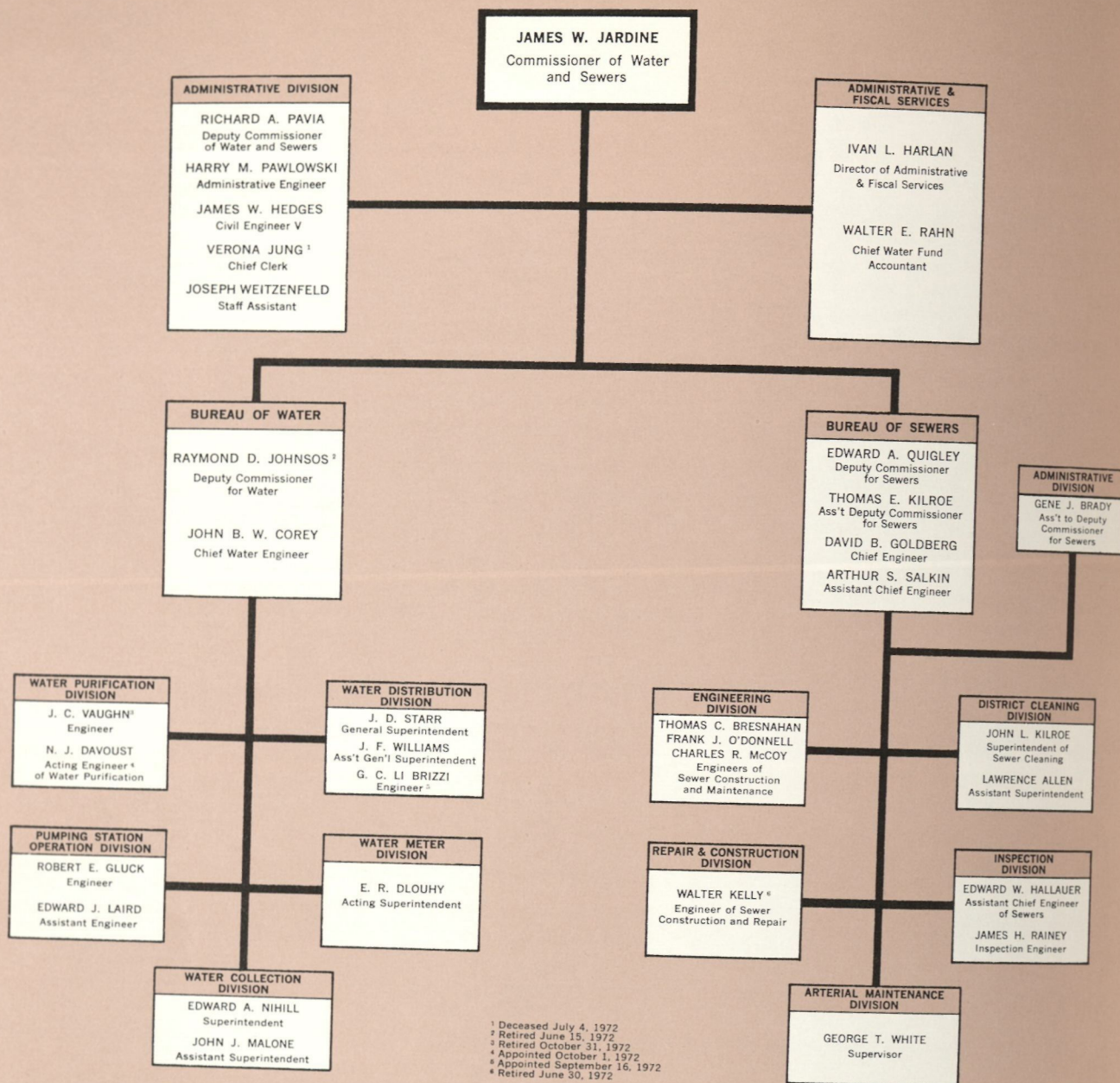
Examination of the records produced by the Department's accident reporting procedures will verify the program's effectiveness. In 1954, the year following the Department's inception, the program was inaugurated. It required that safe work practices be followed in the operation and maintenance of Chicago's publicly owned water and sewer utilities. Since then, the Department has consistently sustained accident frequency rates and severity rates well below the national average rates compiled by the National Safety Council. The accident frequency rate is determined by the number of accidents that have occurred during a year per million man-hours worked; the severity rate, by the days lost due to injury per million man-hours worked.

The many American Water Works Association and National Safety Council awards presented to the Bureaus since they were combined into the Department of Water and Sewers provide additional testimony to an outstanding safety record.

AVERAGE ACCIDENT RATES FOR WATER UTILITIES



DEPARTMENT OF WATER AND SEWERS



¹ Deceased July 4, 1972
² Retired June 15, 1972
³ Retired October 31, 1972
⁴ Appointed October 1, 1972
⁵ Appointed September 16, 1972
⁶ Retired June 30, 1972

ADMINISTRATION AND FUNCTIONS

The Commissioner of Water and Sewers, as chief executive officer of the Department, is directly responsible to the Mayor and the Chicago City Council. He is assisted by the Deputy Commissioner of Water and Sewers. Each of the component Bureaus, the Bureau of Water and the Bureau of Sewers, is headed by a Deputy Commissioner.

The Bureau of Water is entrusted with the operation and maintenance of the Chicago Water System which furnishes a good quality, filtered water to all of Chicago and 72 suburbs. The Bureau is composed of five Divisions: (1) the Purification Division which operates and maintains the two largest water treatment plants in the world and monitors the water supply to insure its potability; (2) the Pumping Operation Division which operates and maintains four water intake cribs and eleven pumping stations; (3) the Water Distribution Division which operates and maintains the water distribution system and constructs water mains as needed; (4) the Meter Division which operates the meter repair shop, installs large meters, inspects and makes repairs of meters in the field and main-

tains complete records on all meters; and (5) the Collection Division which reads meters in service, and bills, collects and accounts for water charges.

The Bureau of Sewers operates and maintains the Chicago Public Sewer System which collects and transports sanitary and industrial wastes and surface water drainage to the interceptor sewers of the Metropolitan Sanitary District of Greater Chicago. The Bureau is composed of the Administrative Division and five other Divisions: (1) the Engineering Division which plans and designs sewer extensions, betterments and major repairs; (2) the Cleaning Division which scrapes and flushes sewers and cleans catch basins on a district basis; (3) the Repair and Construction Division which makes repairs to the Sewer System on a district basis; (4) the Arterial Maintenance Division which cleans and repairs City arterial highway sewers; and (5) the Inspection Division which supervises sewer construction, the installation of connections and the underground work of others done near public sewers to protect the sewers from damage.

FINANCIAL REPORTS

The Chicago Water System is supported entirely through revenues received from the sale of water. The System receives no funds from real estate or other tax levies. Accordingly, as a municipally owned and operated utility, the water rates are designed to cover operating, maintenance, and debt service costs. The Chicago Water System is not operated for profit.

The preliminary balance sheet submitted with this report was prepared on a utility (accrual) basis. The final and official statement submitted by the City Comptroller in his report for 1972 will reflect any adjusting entries arising from audit and accordingly, may differ slightly from these earlier and preliminary statements.

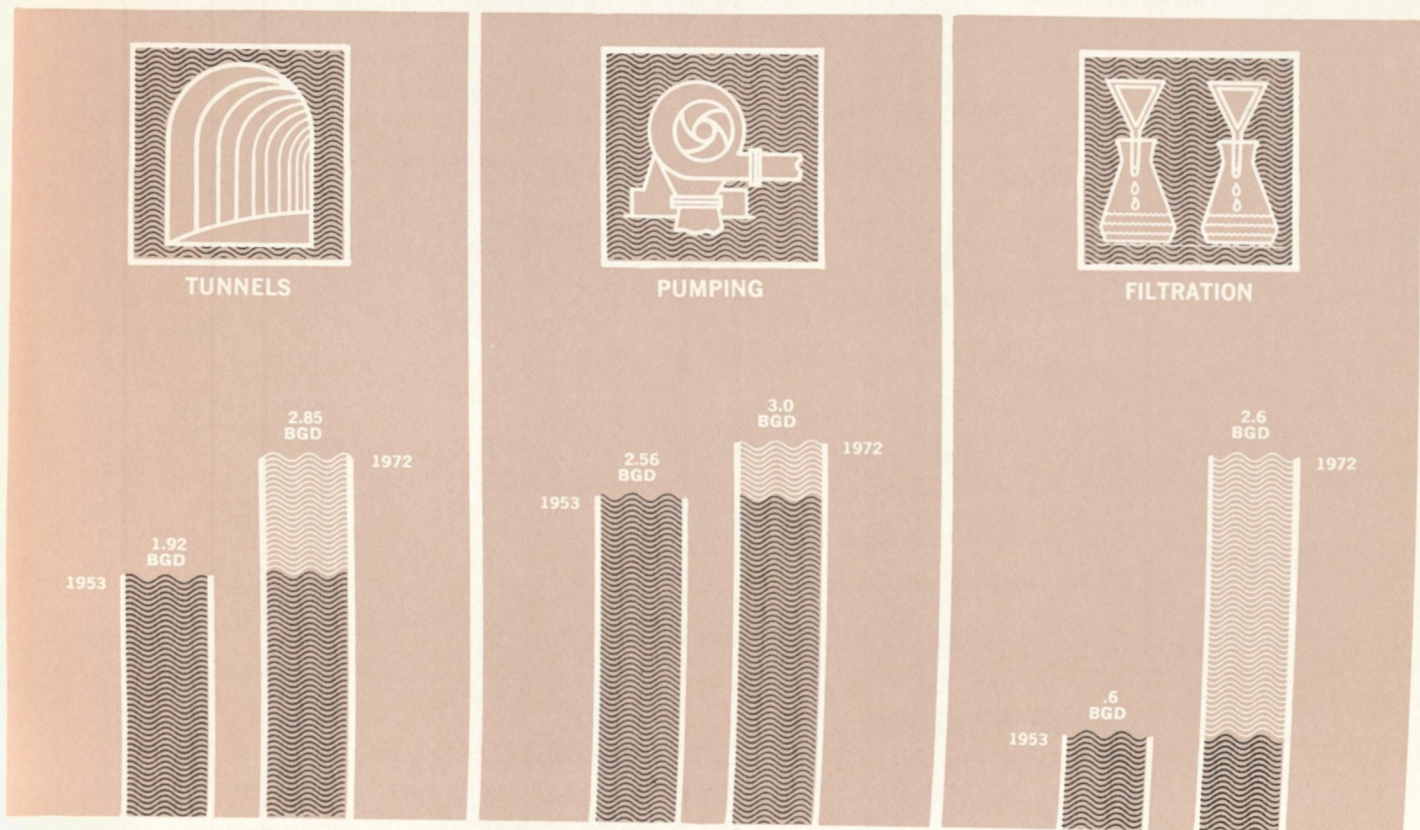
The total investments in capital assets rose from \$546.4 million dollars to \$561.9 million

dollars during the year. While the net book value of the Water Funds Capital Assets are carried at 438 million dollars, the estimated actual replacement valued conservatively would exceed a billion dollars.

During 1972 operating and maintenance expenses, before an estimated provision for depreciation of \$8,275,000, are expected to increase very modestly to \$57.1 million dollars from \$56.4 million dollars of operating expenditures incurred during 1971.

The Preliminary Statement of Cash Flow was prepared on an actual cash receipts and disbursements basis, while the Preliminary Combined Balance sheet presented on the following page was prepared on a utility basis, as was the Statement of Investment in Capital Improvements 1953-1972 appearing on page 23.

CHICAGO WATER SYSTEM INSTALLED CAPACITIES COMPARISON 1953*-1972
(IN BILLIONS OF GALLONS PER DAY)



*THE DEPARTMENT OF WATER AND SEWERS WAS ESTABLISHED AS A SEPARATE ENTITY JANUARY 1, 1953.

***PRELIMINARY COMBINED BALANCE SHEET—UTILITY BASIS**
At December 31, 1972

ASSETS

Utility Plant:

Structures, Improvements and Equipment	\$549,835,821
Less: Accumulated Depreciation	<u>123,933,190</u>
Net: Structures, Improvements and Equipment	\$425,902,631
Land and Land Rights	1,949,247
Construction Work in Progress	<u>10,171,823</u>
NET UTILITY PLANT	

\$438,023,701

Investment in Working Capital Funds

5,883,991

Current Assets:

Cash Deposited and on Hand	\$ 17,306,986
Accounts Receivable	7,903,874
Due from Other City Funds	7,155,469
Inventories	<u>1,949,365</u>

TOTAL CURRENT ASSETS

34,315,694

TOTAL ASSETS

\$478,223,386

LIABILITIES AND CITY EQUITY

City of Chicago Equity

\$279,865,667

Long Term Liabilities:

Certificates of Indebtedness due beyond one year	\$176,200,000
Water Pipe Extension Certificates	748,418
Contracts Payable for Water Main Installations	<u>189,600</u>

TOTAL LONG TERM LIABILITIES

177,138,018

Current Liabilities:

Certificates of Indebtedness due within one year	\$ 8,100,000
Vouchers Payable	11,496,157
Interest Payable	1,588,694
Refunds and Judgments Payable	<u>34,850</u>

TOTAL CURRENT LIABILITIES

21,219,701

TOTAL LIABILITIES AND CITY EQUITY

\$478,223,386

*These statements represent a preliminary financial summary of the Water Funds and are not final. Final statements will be included in the City Comptroller's Report for 1972.

CITY OF CHICAGO—WATER WORKS FUNDS
*PRELIMINARY STATEMENT OF CASH FLOW
For the Year Ended December 31, 1972

	Detail	Amount	%
CASH BALANCE, JANUARY 1, 1972		\$ 28,163,929	
CASH RECEIVED FROM:			
Sale of Water:			
Loop and Large Commercial Consumers	\$15,108,945		22.07
Large Industrial Consumers	11,648,602		17.02
Smaller Metered Consumers	10,259,529		14.99
Suburbs and Consumers in Unincorporated Areas	17,224,530		25.16
Total from Metered Sales	\$54,241,606		79.24
Single and Double Unit Residential Dwellings	14,212,916		20.76
Total Cash from Sales of Water	\$68,454,522		100.00
Permits, Rentals, Reimbursements, Financial Income, Sale of Salvage, and various other Cash Received	1,539,151		
Services Provided to Other Funds	8,936		
Proceeds from Water Certificates Sold in 1971 deposited in January 1972	10,500,000		
Total Cash Received During Year		80,502,609	
Total Cash Available During 1972		<u>\$108,666,538</u>	
CASH USED FOR:			
Source of Supply	\$ 529,829		.58
Power and Pumping	8,357,829		9.15
Purification	8,284,246		9.07
Transmission and Distribution	17,295,751		18.93
Drainage, Maintenance and Operation	10,770,688		11.79
Consumer Accounting and Collection	3,106,563		3.40
Administration and General	6,230,847		6.82
Total Operating Expenses	\$54,575,753		59.74
Debt Service:			
Interest on Judgments	\$ 3,000		.00
Interest on Water Certificates	8,000,000		8.76
Water Main Extension Contracts	86,796		.10
Water Pipe Extension Certificates	80,448		.09
Redemption of Water Certificates	8,100,000		8.86
Total Debt Service	\$16,270,244		17.81
Capital Improvements	15,139,494		16.57
Inventory Purchases	2,640,119		2.89
Payments to Other Funds	7,013,882		7.68
Judgments Paid	49,784		.05
Total Cash Disbursements During Year	\$95,689,276		
Increase in Vouchers Payable 1972	(4,329,724)	(4.74)	
Net Cash Disbursements		<u>\$ 91,359,552</u>	100.00
CASH BALANCE, DECEMBER 31, 1972		<u>\$ 17,306,986</u>	

*The final statement of cash flow will reflect any adjusting entries arising from audit and accordingly, may differ slightly from this earlier and preliminary statement.

CAPITAL IMPROVEMENTS PROGRAM

The five-year capital improvement program for the Chicago Water System was planned in cooperation with the departments of Public Works and Development and Planning. It covers the years 1972 through 1976. This program, subject to annual revision and approval by the City Council, provides for new investments in the Water System of \$161,209,000 in the five-year period.

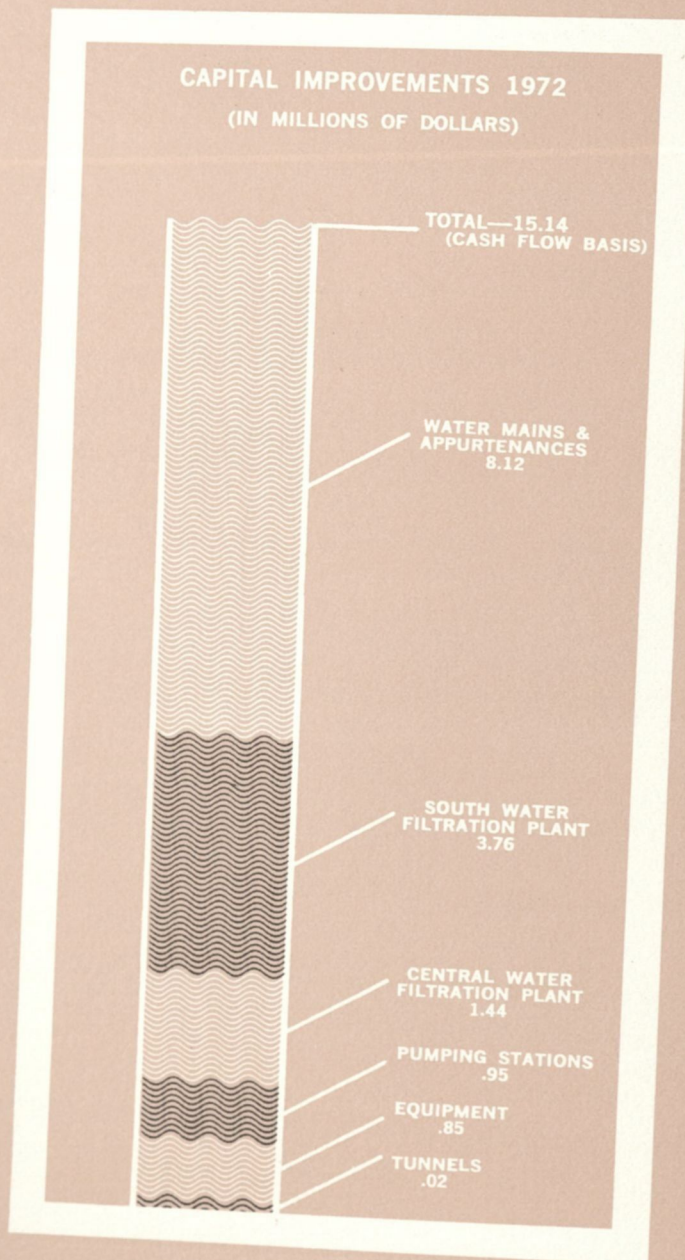
These improvements include \$26,733,000 for the filtration plants, \$49,960,000 for tunnels, reservoirs, and pumping stations, and \$84,516,000 for water main construction.

An expenditure of \$155,439,000 is projected for additions to the Chicago Sewer System including storm water control elements. This program is planned and administered by the Department of Public Works with the Department of Water and Sewers assuming responsibilities for maintenance and operation of these facilities after completion.

In keeping with this ongoing program of new and expanded services in the system's plants and facilities, over \$15,000,000 was invested in the Chicago Water System during 1972. Included in this was 8.12 million dollars for water mains and appurtenances. Nearly \$2.5 million was spent on additions and replacements of service mains. Cleaning and lining of feeder mains accounted for half a million dollars. Other important program projects covered the intersection of Blue Island, Ashland, and Cermak, an Ashland Avenue project extending south of Cermak Road, and Phase II of a project for the construction of a 36" main to better serve the North Shore Area due to increasing demand by high rise apartments.

Nearly a million was expended on improvements of pumping stations, including \$675,000 for the boiler conversion at Mayfair and \$117,000 for rehabilitation of a crane at Central Park. Purchase of a 60 M.G.D. pump for Lakeview accounted for \$90,000.

Improvements at the filtration plants included electrical substations for the Central Filtration Plant totaling \$125,000 and a sediment disposal system costing three and a quarter million dollars. The sediment disposal system was installed in support of environmental control efforts. Also at the Central Filtration Plant, venturis for clearwells and flash mixers amounted to \$100,000. At the South Filtration Plant, improvements were accomplished, totaling 3.75 million dollars. The major items involved were low lift pumps, boiler replacement, a chlorine building addition, and 36" filter drain valves. A sediment disposal system costing \$400,000 was installed at the South Filtration Plant in support of environmental efforts for Lake Michigan.



INVESTMENT IN CAPITAL IMPROVEMENTS 1953-1972

Bureau of Water

Filtration Plants	\$138,176,279
Pumping Stations	27,020,277
Water Tunnels & Cribbs	8,253,316
Water Mains & Distribution System	143,154,159
Equipment	6,483,341
Total Investment	<u>\$323,087,372</u>

Bureau of Sewers*

Investment in Capital Improvements	\$176,669,815
Total Water and Sewers	<u>\$499,757,187</u>

*Constructed by the Department of Public Works, Illinois Division of Highways and Cook County Highway Department with maintenance and operation the responsibility of the Department of Water and Sewers.

CAPITAL IMPROVEMENTS PROGRAM 1972-1976

Bureau of Water

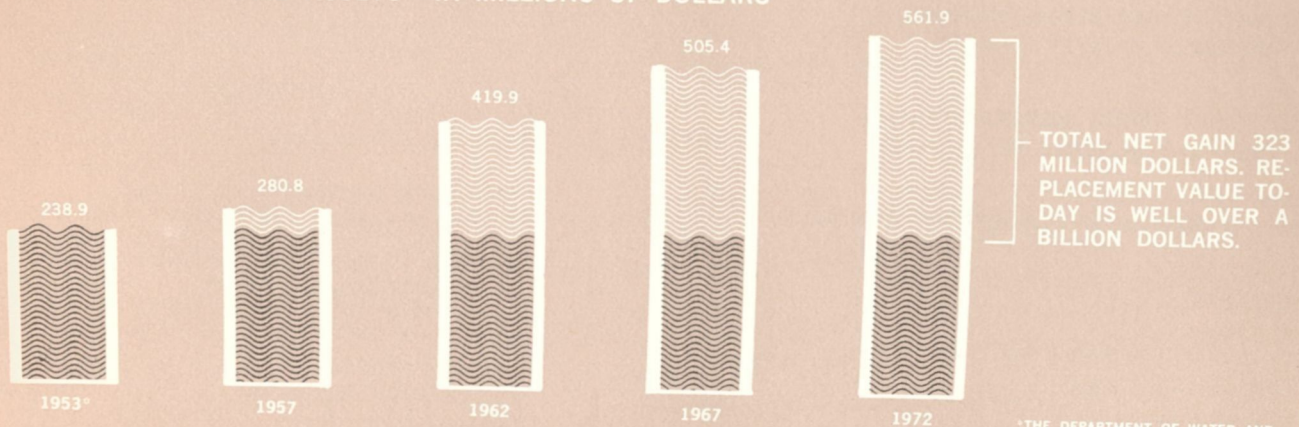
Filtration Plants	\$ 26,733,000
Pumping Stations	14,715,000
Water Tunnels and Reservoirs	35,245,000
Feeder Mains 24" Dia. and Larger	19,516,000
Small Mains	60,000,000
Cleaning and Lining of Feeder Mains	5,000,000
Total Program	<u>\$161,209,000</u>

Bureau of Sewers*

Capital Improvements Program 1972-1976	\$145,939,000
Storm Water Control (O'Hare Airport)	9,500,000
Total Program	<u>\$155,439,000</u>
Total Water and Sewers	<u>\$316,648,000</u>

*Programmed under the direction of the Department of Public Works.

INVESTMENT IN FIXED ASSETS—IN MILLIONS OF DOLLARS



*THE DEPARTMENT OF WATER AND SEWERS WAS ESTABLISHED AS A SEPARATE ENTITY JANUARY 1, 1953

MAJOR STATISTICS FOR 1972

SEWERS

EXISTING SEWER SYSTEM

Miles of Sewer	4144.28
Catch Basins	214,225
Manholes	148,411

1972 NEW SEWER CONSTRUCTION

Miles of Sewers—all sizes	12.36
Catch Basins	730
Manholes	402

INSPECTIONS	157,279
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COMPLAINTS HANDLED	54,551
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REPAIRS

Total Number of Sewer System Repair Jobs	9,387
Main Sewer Breaks	439
Catch Basins	5,850
Manholes	1,661
Gutter Grates and Basin Outlets	1,437

CLEANING

Sewers Scraped—Feet	10,087,412
Catch Basins Cleaned	292,245

STREET GRADES ESTABLISHED AND APPROVED BY CITY COUNCIL	75
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STANDARD BENCH MONUMENTS AND ORDINARY BENCHES ESTABLISHED	162
--	-----

BENCH MONUMENTS/CONSTRUCTED IN 1972	18
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RECEIPTS

House Drain Permit Fees	\$ 65,615
Other Permit Fees	87,209
Special Deposits	149,048
Out-of-Town Connection Fees	51,128
Drain Layers' License Fees	42,300
Total Receipts	\$ 395,300

WATER

POPULATION AND AREA SERVED

(Based on Reliable Estimates)

Population supplied:

Chicago (1970 U.S. Census 3,366,957)	3,367,000
Suburban (1970 Census as revised)	1,169,000
Total	4,536,000

Area served (in square miles):

Chicago	227
Seventy-two suburbs	213
Total	440

PER CAPITA CONSUMPTION

	Gallons Per Day
Chicago	249
Suburban	146
Average	223

CHEMICAL AND PHYSICAL QUALITIES OF WATER SUPPLIED TO CENTRAL WATER FILTRATION PLANT BY CRIBS

Total hardness (as parts per million)	
Calcium Carbonate	129
Water temperatures: Intake	
Average	45
Maximum	66
Minimum	32

PUMPAGE

	Gallons
Annual	
Chicago	307,383,000,000
Suburban communities and industries (metered)	62,501,000,000
Total*	369,884,000,000

*(Amount through Western Ave. Reservoir)	1,644,000,000
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Annual Metered Consumption in Chicago (52.3%† of Chicago pumpage)	160,658,000,000
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†Percentage of Revenue
from Metered rates: 79.2%

Daily	
Total daily average	1,010,600,000
Maximum day, August 18	1,662,980,000
Maximum hour (rate) August 18, 4:00 P.M.	2,252,000,000
Daily Average — Chicago	839,800,000
Daily Average — Suburban	170,800,000

WATER

PURITY CONTROL

Laboratory tests made:	
Microbiology Laboratory	226,187
Microscopy Laboratory	21,347
Chemical Laboratory	147,392
Control Laboratory S.W.F.P.	150,408
Control Laboratory C.W.F.P.	266,360
Total tests made	811,694

BACTERIOLOGICAL RESULTS

Annual average coliform organisms per 100 ml*

	South District		North & Central District	
	Crib	Shore	Crib	Shore
Raw (MPN)	16	22	12	24
Plant Outlet (MF)*	0.020		0.004	
Pumping Stations (MF)*	0.000		0.000	
on Distribution				
Systems (MF)*	0.014		0.059	

*U.S. Public Health Service Standards for safe drinking water by the membrane filter (MF) technique specifies that the arithmetic mean of all standard samples examined each month shall not exceed 1.0 coliform organisms per 100 ml.

PURIFICATION TREATMENT

	Gallons
Complete Filtration Treatment	384,792,000,000

CHEMICALS APPLIED — TONS

	SWFP	CWFP
Chlorine	957	1744
Aluminum Sulfate (17% Al ₂ O ₃)	4399	6858
Activated Carbon	193	29
Lime (as CaO)	1552	2998
Ferrous Sulfate (as FeSO ₄)	520	1542
Anhydrous Ammonia	166	218
Hydrofluosilicic Acid (as Fluorine)	533	867
Caustic Soda (NAOH)	—	1645

SUPPLY

Crib intakes in service	3
Crib intakes on stand-by service	1
Shore intakes	2
Miles of water supply tunnels under lake and land (6 to 20 feet in diameter)	72.6

PUMPING

Pumping stations	11
Pumps available for service	53
Installed pumping capacity (Million gallons per day)	2,995

WATER

ANNUAL PUMPAGE

	Million Gallons
By electrically driven pumps	153,475
By steam driven pumps	216,409
Total annual pumpage	369,884
Coal used by steam powered pumps (tons)	43,047
Electric power used by electrically powered pumps (kilowatt hrs.)	80,378,020
Oil (Gallons)	67,769
Gas (Therms)	18,929,342

DISTRIBUTION

Water Mains: (in miles)

In use—December 31, 1972	4149.05
Extended	15.34
Abandoned	7.34
Net addition to system	8.00
Diameter of pipe (inches)	6 to 60

Fire Hydrants:

In use—December 31, 1972	46,240
Installed	180
Abandoned	104
Net Increase	76

Valves:

In use—December 31, 1972	43,341
Installed	230
Abandoned	69
Net Increase	161

Pressure range in mains (lbs. per square inch) ..	28 to 58
Average pressure at curb (lbs. per square inch) ..	36
Miles of pipe tested for underground leakage ..	2712
Premises inspected—house to house leakage survey ..	27,813
Repaired main breaks—6 inch to 48 inch diameter	249

METERS

In service—December 31, 1972	164,049
Installed by Master Plumbers	800
Installed by Water Distribution Division	301
Total	1101
Removed	1040
Net Increase	61
Repaired on premises	13,366
Repaired in shops	15,261
Tested	16,203
Non-metered (assessed rate) services	347,007
Total Services (assessed and metered)	511,056

SUPPLEMENTS COVERING COMPLETE 1972 WATER OR SEWER STATISTICS ARE AVAILABLE UPON REQUEST.

ANNUAL REPORT 1972 - DEPARTMENT OF WATER AND SEWERS - CITY OF CHICAGO



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